

A GROUPWARE SYSTEM IN MONITORING CONSTRUCTION PROJECT
PLANNING APPROVAL

GOH KAI CHEN

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Special gratitude dedication to.....

My dearest parents,

For your love, care and support,

My brothers and sisters,

For your helpfulness, encouragement and confidence in me.

My lecturers,

Thank you very much for your continued support, guidance and kind assistance in
making sure the success of my project.

My friends in UTM

For helping me whenever I in difficulties.

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ABSTRACT

This research is dealing with the development of a groupware system for the engineers and the experts in order to monitor construction planning approval process in the pre-construction phase. This research will also focus on managing and sharing the knowledge among the parties involve in the pre-construction phase. Hence, the first objective of the study is to review the development of knowledge Management (KM) concepts and framework in construction. Secondly is to study the procedures and processes of planning approval by local authorities in construction project. Eventually, a groupware system for engineers and experts, in monitoring construction project planning approval in the pre-construction phase of a project has been developed. The research methodologies used are a case study method, archived document analysis and the groupware development model. It is hope that the developed groupware can give an alternative approach for the engineers and the experts in monitoring, controlling and managing planning approval process during the pre-construction stage.

ABSTRAK

Penyelidikan ini adalah berkaitan dengan pembangunan suatu sistem *groupware* kepada jurutera-jurutera dan pakar dalam memantau proses kelulusan perancangan dalam fasa pra pembinaan. Penyelidikan ini turut menfokus kepada pengurusan dan perkongsian pengetahuan antara pihak-pihak yang terlibat dalam fasa pra pembinaan. Oleh itu, objektif yang pertama untuk penyelidikan ini adalah untuk mengenalpasti pembangunan bagi konsep pengurusan pengetahuan dan rangka kerjanya dalam industri pembinaan. Manakala objektif yang kedua adalah untuk mengkaji proses dan prosidur bagi kelulusan perancangan dalam projek pembinaan yang ditentukan oleh pihak berkuasa tempatan. Untuk tujuan ini, sebuah sistem *groupware* kepada jurutera-jurutera dan pakar dalam memantau proses kelulusan perancangan telah dibangunkan. Metodologi penyelidikan yang dilaksanakan untuk penyelidikan ini adalah melalui kaedah kajian kes, analisis dokumen berarkib dan model pembangunan perisian berkumpulan. Maka, diharapkan bahawa pembangunan *groupware* ini dapat memberi kaedah alternatif kepada jurutera-jurutera dan pakar dalam mengawas, mengawal dan menguruskan proses kelulusan perancangan dalam fasa pra pembinaan.

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LIST OF ABBREVIATIONS

ADSL	-	Asymmetric Digital Subscriber Line
CBR	-	Case Based Reasoning
CFO	-	Certificate of Fitness Occupation
DBMS	-	Database Management System
FAQ	-	Frequent Ask Questions
GPL	-	General Public License
GUIs	-	Graphical User Interfaces
HTML	-	HyperText Markup Language
HTTP	-	Hypertext Transfer Protocol
ICT	-	Information and Communication Technology
INSEAD	-	European Institute of Business Administration
ISDN	-	Integrated Services Digital Network
ISO	-	International Standards Organization
ISP	-	Internet Service Provider
IT	-	Information Technology
JKHB	-	Jawatankuasa Hasil Bumi
KB	-	Knowledge Base
KKPP	-	Kaedah - Kaedah Pengawalan Perancangan
KM	-	Knowledge Management
LAMP	-	Laboratory for Advanced Media Production
MBJB	-	Majlis Bandaraya Johor Bahru
MMK	-	Majlis Mesyuarat Kerajaan
PA	-	Power of Attorney
PAMG	-	Planning Approval Monitoring Groupware

PBT	-	Pihak Berkuasa Perancang Tempatan
PDF	-	Portable Document Format
PHP	-	Hypertext Preprocessor
PTD	-	Pentadbir Tanah Daerah
PTG	-	Pejabat Tanah dan Galian
PUIC	-	Planning Unit Improvement Co-ordinator
R&D	-	Research and Development
RDBMS	-	Relational Database Management Systems
RUIC	-	Regional Unit Improvement Co-ordinator
SBKS	-	Serah Balik Kurnia Semula
SQL	-	Structured Query Language
UKBS	-	Undang-Undang Kecil Bangunan Seragam

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CHAPTER 1

INTRODUCTION

1.1 Introduction

Knowledge is the real asset of a marketing-oriented organization, and its integration across departments and disciplines should be emphasized (Carneiro, 2001). Many organizations are now engaged in Knowledge Management (KM) efforts to leverage knowledge both within their organization and externally to the benefit of their stakeholders and customers (Malhotra, 2000-2001). The reuse of information and knowledge minimizes the need to refer explicitly to past projects, reduces the time and cost of solving problems and improves the quality of solutions during the pre-construction phase of a construction project. If experience and knowledge are shared, then the same or similar problems in construction projects do not need to be repeatedly solved. Reduced problem-solving has the following advantages; (1) The cost of problem solving is reduced and (2) the probability of repeat problems is decreased. Several enabling activities should be considered to help to achieve the ultimate goal of efficient experience and knowledge reuse; experience and knowledge should be preserved and managed; that is, they should be captured, modeled, stored, retrieved, adapted, evaluated and maintained (Bergmann, 2002).

The latest communication and information technology (i.e., communities of practice and chat rooms) can improve collaboration, coordination and information exchange among organizations that are involved in construction projects (Soilbelman and Kim, 2002). They can be described as a set of information exchange platforms that collect, retrieve, process, store and distribute data to support planning, control, management and decision-making among organizations involved in the project. (Wilkins and Barrett, 2000). In a dynamic construction environment, the ability to exchange information from various sources and in different formats becomes crucial to the implementation of the construction processes supported by these systems. Furthermore, the collected data, information and knowledge constitute an important and valuable source to be drawn on in managing construction knowledge. Reusing and updating knowledge improves the execution of future activities and projects.

Most of the data and information used in construction projects are stored in paper documents; they include contracts, specifications, notes, summaries of discussions and field reports. Converting paper documents into electronic versions to be shared and applied in future projects is important and necessary in facilitating information management and supporting the reuse of knowledge. Information and knowledge associated with a project can then be identified as active unit in the project management and preserved in a web-based system that provides the platform for exchanging and storing this information and knowledge.

1.2 Problem statement

Construction projects are complex and time-consuming, which have usually been characterized by their complexity, diversity and the non-standard nature of the production (Clough et.al, 2000). Whatever successful and unsuccessful projects have been executed by the general contractors, a valuable record of each one should be kept to identify best and worst company practices. During the pre-construction phase of projects, there are several stages in planning approval of a project. These stages consist of different local authority and consist of different procedure and process of approval.

Therefore, an effective means of improving construction management is to monitor among the approval process, which helps the engineers and experts in knowing about construction projects in the municipality more quickly, allowing them to make better informed decisions about their future in the construction project. Unfortunately, the construction project planning approval process usually takes about 6 months to 10 months. When the engineers and experts are planning for the projects, they normally take a long time in waiting for the approval of local authority without knowing the reason of why it takes a long time. Based on this situation, the engineers and experts facing problems in implementing future activities and projects.

1.3 Research Objectives

1. To illustrates the main concepts and framework of knowledge management in construction.
2. To investigate the procedures and processes of planning approval by local authorities in construction project.
3. Develop a groupware system for engineers and experts, in monitoring construction project planning approval in the pre-construction phase of a project.

1.4 Scope of the Study and Limitation

In order to achieve the objectives for this study, the scope of the study will be focusing on the study on the procedures and processes of planning approval by local authorities are limited to the local council of Johor Bahru (MBJB). This is because of different states of local council have their own types of procedure in processing planning approval. Therefore, due to the limitation, the scope will be focus on the local council of Johor Bahru (MBJB).

Besides, the development of groupware system will be based on several Construction of Petrol Station projects in Johor Bahru, which is based on the procedures and processes of planning approval by the local council of Johor Bahru (MBJB). The observation would be made to determine the needs of the project in order to monitor the construction planning approval in pre-construction stage. The groupware system created would be also a contribution towards improving the current methodologies in monitoring the process of planning approval so that it will not takes a long time during pre-construction stage and also helping the engineers and experts to make better informed decisions about their future for the project.

1.5 Justification of Research

Knowledge management is a discipline of identifying, capturing, retrieving, sharing and evaluating an enterprise's information assets (Awad and Ghaziri, 2004). Knowledge management in construction projects promotes an integrated approach to the creation, capture, accessing and use of a professional's domain knowledge of products, services and processes.

Knowledge management concepts can be effectively used during the pre-construction phase of a project to enable the engineers and the experts to know about construction projects in the municipality more quickly and allowing them to make better informed decisions about their future for each project.

Besides, with the groupware system, the approval process within the local council will be managed online. The schedule of all submissions will be tracked - all correspondence, communications and documents will be organized for immediate, sequenced action and warehoused for easy reference. Besides, the full council meeting date due to the approval of the project will be recorded for the information and helps the engineers to monitor the task for the pre-construction stages and improves the results of the entire construction project.

In addition, the significance of this research lies the strength of filling these research evolve a more flexible knowledge management process that create a more

informal environments that encourage employees to monitor, to control and manage during the pre-construction stage. The findings of this research will be enable the construction industry to know how to use low cost existing information and communication technology (ICT) to increase their capacity to process information.

1.6 Organization of Master Project Report

Chapter one of the dissertation was given introductory of the study background. It included the problem of statement and importance of study for justification purposes. Aims & Objectives of study create the target of study to be achieved. Scope highlight the entirely path of study process to obtain the necessary information & knowledge acquired.

Chapter two is a review related to literature and works on knowledge management and the procedures of construction project planning approval. It looks into the theory of knowledge, concepts in knowledge management, knowledge management process, knowledge management tools and knowledge management in construction. Besides, it consists of the processes and procedures of planning approval by local authorities.

Chapter Three outlines a research framework fir study that includes an introduction of case study methodologies and also the methodologies in development a groupware system. Discusses consideration factor in using case study method including the background and logic for unit of analysis. It describes a case study process and steps that can be used to guide this research and subsequent studies. Besides the process and steps in developing a groupware system will be also used as a guide for this research.

Chapter Four presents a study the procedures of implementing knowledge management for construction project. In this chapter, the procedure of a web- based knowledge management system will be recommended and it will captures technical and non-technical knowledge that resides in the construction project, and structured them in such a way that it is easy to reuse.

Chapter Five discusses the development of a groupware system for engineers and experts that is used to monitoring construction project planning approval in the pre-construction phase of a project.

Chapter Six is the conclusion of the study which provides summary of the major findings, the discussion on limitations, and to provide recommendations for further works.

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